A few paragraphs are poorly written. For example, the last paragraph on page 131 is surely not in the form intended. Also, the expression *Since* a_1 *and* a_2 *are not integers,* in the last paragraph on page 135, seems to be out of place. The repetition of the formula for K on page 138 seems unnecessary—it is given on the preceding page. The formulas for S_3, S_4 and S_5 on page 98 are almost too badly mixed and the expression for $1/y \cdot dy/dx$ in terms of the moments is almost too poorly aligned to be unravelled by the student. But the trouble in both cases is typographical.

The latter part of the book is a little too condensed, especially the part of the appendix devoted to the Pearson types of frequency curves, which cannot be used except for purposes of reference unless supplemented by explanations and illustrations by an experienced instructor. Reference should have been made to the types of curves recently developed by Pearson as well as to the interesting abacus given in Pearson's Tables to be used in distinguishing the various types.

The treatment of the various kinds of averages is good although the reviewer believes that the weighted arithmetic average should be regarded as a special form of the ordinary arithmetic average—where the various conceptions of *weight* take the place of *frequencies*.

Correlation theory is treated at great length, as it deserves, although the important correlation surface and its equation, with its important relation to the correlation coefficient, is unfortunately omitted in order to avoid more advanced mathematical principles. The distinction between the correlation coefficient and the correlation ratio is well explained.

Most of the errors found in the book are trivial and of the kind which it is almost impossible to avoid in a book dealing with a virgin field. On the whole, Dr. West's book promises to fill well the long felt want for a textbook on mathematical statistics and no longer need instructors depend solely upon their own notes and lectures. The fact that the book is well provided with good examples should make it especially successful as a text-book.

C. H. Forsyth.

Dartmouth College.

PROBLEMS FOR SOLUTION.

Send all communications about problems to B. F. Finkel, Springfield, Missouri.

It is to be understood that problems proposed for solution or solutions of problems which have been proposed in the Monthly are welcomed from all readers, whether subscribers or not. Single copies containing these problems or solutions will be sent to those contributing, provided their addresses are known to the Secretary of the Association.

2727. Proposed by H. J. WOODALL, Stockport, England.

Having given $2^k \equiv +k \pmod{p}$ and ξ the haupt-exponent of 2 for mod p (ξ is the least power of 2 whose residue, for modulus p, is plus unity) solve $x \cdot 2^x + 1 \equiv 0 \pmod{p}$.

Also, as regards the inverse problem, what do we know about the factors of $N \equiv b\cdot 2^b + 1$, when b is a known positive integer, e. g., $b = 141$.

2728. Proposed by NORMAN ANNING, Somewhere in France.

A material triangle of uniform density and thickness is of such a shape that when suspended from the vertices in succession, the lower sides have slopes of $1:1$, $1\frac{1}{2}:1$, and $3:1$. Construct the triangle given that the shortest side is 10 inches.

By definition, an $a:1$ slope makes an angle with the vertical whose tangent is a.

2729. Proposed by N. P. PANDYA, Sojitra, India.

Solve in integers $x^3 + 3y^4 = z^2$.

2730. Proposed by W. E. HEAL, Washington, D. C.

If $z^n = x^n + y^n$, where x, y, z, n are integers, and n prime, prove that

$$\{z^{(n-1)/2}[(z-x)x^{(n-1)/2} + (z+y)y^{(n-1)/2}]\}^2 + \{x^{(n-1)/2}[2x^{(n+1)/2} + y^{(n-1)/2}(x-y)]\}^2$$
$$= \{z^{(n-1)/2}[(z+x)x^{(n-1)/2} + (z-y)y^{(n-1)/2}]\}^2 + \{y^{(n-1)/2}[2y^{(n+1)/2} - x^{(n-1)/2}(x-y)]\}^2$$
$$= [z^{n+1} + (x^{(n+1)/2} - y^{(n+1)/2})^2] \times [z^{n-1} + (x^{(n-1)/2} + y^{(n-1)/2})^2].$$

Also prove that $z^{n+1} + (x^{(n+1)/2} - y^{(n+1)/2})^2$ and $z^{n-1} + (x^{(n-1)/2} + y^{(n-1)/2})^2$ have no common factors except the divisors of $z^{n-1}(z+x)(z+y)$.

2731. Proposed by JAMES K. WHITTEMORE, Yale University.

A bowl is in the form of a paraboloid of revolution. If for a given volume the surface is a minimum, prove that the ratio of the diameter of the top to the depth is approximately 1.86.

SOLUTIONS OF PROBLEMS.

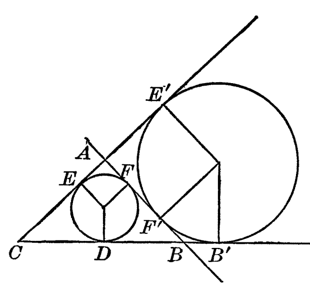
2660. Proposed by JOSEPH E. ROWE, State College, Pa.

Prove that the distance measured along the side of a triangle, from the point of contact with the inscribed and escribed circle, is equal to the side of the triangle between the two circles.

SOLUTION BY GEORGE F. WILDER, Brooklyn, N. Y.

Let ABC be the triangle and s its semi-perimeter. From the equalities $AE = AF$, $CE = CD$, and $BD = BF$, we have $s = AE + CD + BD$, or $s = AE + a$, since $CD + BD = a$. Hence, $AE = s - a$, (1). Also, since $AE' = AF'$ and $BF' = BD'$, $CE' + CD' = 2s$. Hence, $CD' = s$, since $CE' = CD'$. Hence, $BD' = CD' - CB = s - a$, (2). From (1) and (2) we have $AE = BD'$.

Now $EE' = EA + E'A = BD' + AF'$, since $AE = BD'$ and $AE' = AF'$, and hence $EE' = BF' + AF' = AB$.



Similar and various other solutions were received from the following contribu ors: J. V. BALCH, HORACE OLSON, PAUL CAPRON, S. W. REEVES, C. P. SOUSLEY, J. F. CONNELLY, ELIJAH SWIFT, and the PROPOSER.

This problem was proposed in an examination test in Cooper Union, New York, and solutions similar to the one above were received from G. J. HARRIS, H. F. MATHUSSEN, I. J. FAJANS, C. J. SCHMITT, H. GLADSTONE, MORRIS DEVORKEN, ANGELO J. SAJIN, DAVID TENNENBAUM, JACOB GREISMANN, I. MILLENKY,